

Amendments to the Claims

Please amend the Claims as shown below. This listing of Claims replaces all prior versions and listings of the Claims in this application.

Listing of Claims

1. (Currently Amended) A bonding pad of a semiconductor device comprising:
a via within an insulation layer over a metal line;
a barrier metal layer on a surface of the via;
a copper layer consisting essentially of copper on the barrier metal layer within the via, the copper layer having vertical side surfaces that contact the barrier metal layer; and
an alloy layer on an upper surface of the copper layer within the via, the alloy layer having (i) a top surface that is coplanar with or lower than a top surface of the insulation layer; wherein and (ii) vertical side surfaces of the alloy layer that contact the barrier metal layer, and the alloy layer consists-consisting essentially of copper and a low melting point metal selected from the group consisting of aluminum, lead, and silver.
2. (Canceled)
3. (Canceled)
4. (Previously Presented) The bonding pad of claim 1, wherein a thickness of the alloy layer is less than a thickness of the copper layer.
5. (Currently Amended) The bonding pad of claim 1, further comprising a protection layer comprising silicon nitride or silicon oxynitride over the insulation layer and the copper layer except for the portion of the copper layer below the bonding padwithin the via.
6. (Canceled)

7. (Canceled)

8. (Previously Presented) The bonding pad of claim 5, wherein a width of the bonding pad is less than a width of the via.

9. (Canceled)

10. (Canceled)

11. (Canceled)

12. (Canceled)

13. (Canceled)

14. (Canceled)

15. (Canceled)

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Canceled)

21. (Canceled)

22. (Previously Presented) The bonding pad of claim 1, wherein a width of the bonding pad is less than a width of the via.

23. (Previously Presented) The bonding pad of claim 1, wherein the barrier metal comprises a metal selected from a group consisting of Ti, Ta, TiN, and TaN.

24. (Previously Presented) The bonding pad of claim 1, wherein the barrier metal has a thickness between 200 and 800 Å.

25. (Canceled)

26. (Canceled)

27. (Previously Presented) The bonding pad of claim 1, wherein the insulation layer comprises an oxide layer.

28. (Previously Presented) The bonding pad of claim 23, wherein the barrier metal layer prevents the diffusion of copper from the copper layer into the insulating layer.

29. (Previously Presented) The bonding pad of claim 1, wherein the alloy layer is completely within the via.

30. (Previously Presented) The bonding pad of claim 1, wherein the barrier metal layer covers all surfaces of the via.

31. (Previously Presented) The bonding pad of claim 5, wherein the alloy layer is exposed through an opening in the protection layer.

32. (Previously Presented) The bonding pad of claim 1, wherein the barrier metal layer has a thickness of ~500 Å.

33. (Canceled)

34. (Previously Presented) The bonding pad of claim 1, wherein the barrier metal layer contacts the insulating layer.

35. (Previously Presented) The bonding pad of claim 5, wherein the bonding pad is exposed through an opening in the protection layer.

36. (Currently Amended) The bonding pad of claim 1, wherein the alloy layer ~~comprises~~consists essentially of copper and aluminum.

37. (Currently Amended) The bonding pad of claim 1, wherein the alloy layer ~~comprises~~consists essentially of copper and either lead or silver.